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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,248	02/17/2004	Michael Kozhevnikov	1-17-10	9662

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Docket Administrator  
(Room 3J-219)  
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EXAMINER

BLEVINS, JERRY M

ART UNIT PAPER NUMBER

2883

DATE MAILED: 10/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/780,248

Applicant(s)

KOZHEVNIKOV ET AL.

Examiner

Jerry Martin Blevins

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*[Handwritten signature]*

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>25 February 2005</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 17, 19, 27-29, and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by US Pre Grant Publication to Garrett et al., number 2002/0131691.

Regarding claim 1, Garrett teaches an apparatus (Figure 1A), comprising: an array of optical fibers (110); at least one wavelength sieve/combiner (diffraction grating 101) that operates on discrete wavelength units; and a first array of micro mirrors (103, shown in more detail in Figure 1B); wherein the optical wavelength sieve/combiner is optically interposed between the array of optical fibers and the array of micro mirrors.

Regarding claim 2, Garrett teaches the limitations of the base claim 1. Garret also teaches that any wavelength within one of the discrete wavelengths units is supplied to or received from the same beam position by the wavelength sieve/combiner (page 4, paragraph 43 – page 5, paragraph 52).

Regarding claim 3, Garrett teaches the limitations of the base claim 1. Garret also teaches an array of micro lenses (Figure 2B, elements 260, 270 and pages 5 and 6, paragraph 55), one micro lens for each optical fiber in the array of optical fibers, the

micro lenses being optically interposed between the array of optical fibers and the wavelength sieve/combiner.

Regarding claim 4, Garrett teaches the limitations of the base claim 1. Garret also teaches an array of collimators (Figure 2B, elements 220, 260, 270), one collimator for each optical fiber, each of said collimators being attached to one of the optical fibers, the collimators being optically interposed between the optical fibers and the wavelength sieve/combiner.

Regarding claims 5 and 6, Garrett teaches the limitations of the base claim 1. Garret also teaches a first focusing system (Figure 1A, lens 102) comprising a lens that focuses output beams from the wavelength sieve/combiner onto the first array of micro mirrors.

Regarding claim 17, Garrett teaches the limitations of the base claim 1. Garret also teaches at least one sensor (Figure 4A, spectral monitor 460) for detecting light at at least a prescribed one of the discrete wavelength units (page 6, paragraph 58).

Regarding claim 19, Garrett teaches the limitations of the base claim 1. Garret also teaches that at least one micro mirror of the array of micro mirrors can tilt around two axes (page 3, paragraph 21).

Regarding claims 27 and 28, Garrett teaches the limitations of the base claim 1. Garret also teaches that the apparatus is adapted to operate at least in part as a multiplexer and at least in part as a demultiplexer (abstract).

Regarding claim 29, Garrett teaches the limitations of the base claim 1. Garret also teaches that the apparatus is adapted so that beams from the optical fibers are

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converging prior to encountering the at least one wavelength sieve/combiner (Figure 2C depicts beams from fibers 110 converging prior to collimating mirror 220, which is also prior to wavelength sieve/combiner 101, Figure 2B).

Regarding claim 31, Garrett teaches an apparatus (Figure 1A), comprising: a sieve/combiner (grating 101); and an array of micro mirrors (103, shown in more detail in Figure 1B); wherein the sieve/combiner is optically interposed between the array of micro mirrors and an array of optical elements (fiber array 110) at least one of which is adapted to supply an optical beam to the apparatus (input port 110-1) and at least one is adapted to receive an optical beam from the apparatus (output port 110-2).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett in view of US Patent to Hatano et al., number 6,721,099.

Regarding claim 7, Garrett teaches the limitations of the base claim 5. Garrett does not teach that the first focusing system comprises a prism, but rather teaches a lens (Figure 1A, element 102). Hatano teaches that prisms can be chosen instead of lenses in order to obtain the same focusing effects (column 3, lines 11-16). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify

Garrett by choosing a prism as the focusing system, as taught by Hatano. The motivation would have been to individually focus the discrete wavelength units.

Regarding claim 30, Garrett teaches the limitations of the base claim 29. Garrett does not teach that a prism optically interposed between the wavelength sieve/combiner and the array of micro mirrors, but rather teaches a lens (Figure 1A, element 102).

Hatano teaches that prisms can be chosen instead of lenses in order to obtain the same focusing effects (column 3, lines 11-16). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Garrett by choosing a prism as the focusing system, as taught by Hatano. The motivation would have been to individually focus the discrete wavelength units.

Claims 8-13, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett in view of US Patent to Lee et al., number 6,269,202.

Regarding claim 8, Garrett teaches the limitations of the base claim 1. Garrett does not teach that the wavelength sieve/combiner comprises at least one thin film optical filter, but rather teaches a diffraction grating (Figure 1A, element 101). Lee teaches that thin film optical filters can be chosen instead of diffraction gratings to serve as wavelength sieve/combiners (column 1, lines 48-50). ). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Garrett by choosing a thin film optical filter as the wavelength sieve/combiner, as taught by Lee. The motivation would have been to reduce loss and increase channel isolation (Lee, column 1, lines 50-53).

Regarding claims 9 and 10, Garrett in view of Hatano teaches the limitations of the base claim 8. Hatano also teaches that the thin film optical filter is mounted on a glass substrate (Figure 1A and column 3, line 66 – column 4, line 6). It would have been obvious to one of ordinary skill in the art to modify Garrett with the thin film filter mounted on a glass substrate taught by Lee. The motivation would have been to improve stability of the filter.

Regarding claim 11, Garrett in view of Lee teaches the limitations of the base claim 8. Garrett also teaches that the wavelength sieve/combiner (replaced by a thin film filter as taught by Lee) is freespace suspended (Garrett, Figure 1A).

Regarding claims 12 and 13, Garrett in view of Lee teaches the limitations of the base claim 8. Garrett also teaches that the wavelength sieve/combiner (replaced by a thin film filter as taught by Lee) passes a portion of all (which includes the subset of some) of the wavelengths incident upon it and reflects a portion of all (which includes the subset of some) of the wavelengths incident upon it, whereby a copy of the incident wavelengths (that a portion is passed for) is created (Figure 5 and page 7, paragraphs 63 and 64).

Regarding claim 15, Garrett teaches the limitations of the base claim 1. Garrett does not teach that there is a plurality of the wavelength sieve/combiners and each of the wavelength sieve/combiners is formed from respective portions of a plurality of strips of thin film optical filters. Lee teaches that thin film optical filters can be chosen instead of diffraction gratings to serve as wavelength sieve/combiners (column 1, lines 48-50). ). It would have been obvious to one of ordinary skill in the art at the time of

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the invention to modify Garrett by choosing a thin film optical filter as the wavelength sieve/combiner, as taught by Lee. The motivation would have been to reduce loss and increase channel isolation (Lee, column 1, lines 50-53). Garrett in view of Lee does not teach a plurality of wavelength sieve/combiners. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a plurality of the wavelength sieve/combiners since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St Regis Paper Co. v. Bemis Co.*, 193 USPQ 8. The motivation would have been to improve coupling between the plurality of fibers and the plurality of micro mirrors.

Regarding claim 16, Garrett teaches the limitations of the base claim 1. Garrett also teaches that the at least one wavelength sieve/combiners is adapted to supply as output one beam for a discrete wavelength unit (Figure 5 and page 7, paragraphs 63 and 64). Garrett does not teach a plurality of strips of thin film optical filter incorporated in the wavelength sieve/combiner. Lee teaches that thin film optical filters can be chosen instead of diffraction gratings to serve as wavelength sieve/combiners (column 1, lines 48-50). ). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Garrett by choosing a thin film optical filter as the wavelength sieve/combiner, as taught by Lee. The motivation would have been to reduce loss and increase channel isolation (Lee, column 1, lines 50-53). Garrett in view of Lee does not teach a plurality of strips of thin film optical filters. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a plurality of strips of thin film optical filters since it has been held that mere



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duplication of the essential working parts of a device involves only routine skill in the art. St Regis Paper Co. v. Bemis Co., 193 USPQ 8. The motivation would have been to improve coupling between the plurality of fibers and the plurality of micro mirrors.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett.

Regarding claim 14, Garrett teaches the limitations of the base claim 1. Garrett does not teach a plurality of wavelength sieve/combiners. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a plurality of the wavelength sieve/combiners since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St Regis Paper Co. v. Bemis Co., 193 USPQ 8. The motivation would have been to improve coupling between the plurality of fibers and the plurality of micro mirrors.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett in view of US Pre Grant Publication to Brennan, III et al., number 2003/0059195.

Regarding claim 18, Garrett teaches the limitations of the base claim 17. Garrett does not teach that the at least one sensor is mounted on the at least one wavelength sieve/combiner. Brennan teaches mounting a sensor on a wavelength sieve/combiner (diffraction grating) (pages 5 and 6, paragraphs 65 and 66). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Garrett with a sensor mounted on a wavelength sieve/combiner as taught by Brennan. The motivation

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would have been to simplify manufacturing and reduce costs (Brennan, pages 5 and 6, paragraphs 65 and 66).

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett in view of US Pre Grant Publication to Mala et al., number 2003/0223679.

Regarding claim 20, Garrett teaches the limitations of the base claim 19. Garrett does not teach that the two axes are substantially orthogonal to the other. Mala teaches micro mirrors which can tilt around two orthogonal axes (abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Garrett with the micro mirrors which can tilt around two orthogonal axes as taught by Mala. The motivation would have been to increase the degrees of freedom of the tilting of the micro mirrors.

Claims 21-23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett in view of US Pre Grant Publication to Wu et al., number 2005/0213877.

Regarding claim 21-23, Garrett teaches the limitations of the base claims 1 and 5. Garrett does not teach a second array of micro mirrors; wherein the optical wavelength sieve/combiner is also optically interposed between the array of optical fibers and the second array of micro mirrors; and a second focusing system that focuses output beams from the wavelength sieve/combiner onto the second array of micro mirrors. Wu teaches a second array of micro mirrors (Figure 3, element 108, as compared to first array of micro mirrors, element 104); wherein a wavelength

sieve/combiner (grating 16) is optically interposed between an array of fibers (56) and both the first and second arrays of micro mirrors and a second focusing system (Figure 3, element 20b as compared to first focusing system 20a) that focuses output beams from the wavelength sieve/combiner onto the second array of micro mirrors.. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Garrett with the second array of micro mirrors and second focusing system of Wu. The motivation would have been to increase the number of input/output fibers (Wu, page 1, paragraphs 10 and 11).

Regarding claim 25, Garrett in view of Wu teaches the limitations of the base claim 23. Wu also teaches that the first and the second focusing system are the same (they are both a lens). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Garrett with the two same focusing systems taught by Wu. The motivation would have been to ease alignment of the focusing systems.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett in view of Wu as applied to claim 23 above, and further in view of Hatano.

Regarding claim 24, Garrett in view of Wu teaches the limitations of the base claim 23. Garrett in view of Wu does not teach that the first and the second focusing system are different. Hatano teaches that prisms can be chosen instead of lenses in order to obtain the same focusing effects (column 3, lines 11-16), implicitly teaching that one focusing system can be chosen to be a lens (as taught by Garrett) while the other can be chosen to be a prism. It would have been obvious to one of ordinary skill in the

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art at the time of the invention to modify Garrett in view of Wu with the different focusing systems as implicitly taught by Hatano. The motivation would have been to improve distinction between output and input wavelengths.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garrett in view of US Pre Grant Publication to Turpin et al.

Regarding claim 26, Garrett teaches the limitations of the base claim 1. Garrett does not teach that the apparatus is adapted to operate in broadcast mode. Turpin teaches an apparatus utilizing a wavelength sieve/combiner which can be adapted to operate in broadcast mode (Figures 5 and 6 and page 4, paragraph 50). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Garrett so as to be adapted for broadcast mode, as taught by Turpin. The motivation would have been to increase the amount of information transferred by the apparatus.

### ***Conclusion***

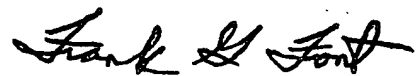
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jerry Martin Blevins whose telephone number is 571-272-8581. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMB



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